Air Resources Board

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Alan C. Lloyd, Ph.D.
Agency Secretary

Arnold Schwarzenegger
Governor

January 6, 2005

Dear Sir/Madam:

The California Air Resources Board (ARB or Board) staff invites you to participate in a Livestock Emissions Research Symposium. At the Symposium, researchers will present their most current findings regarding the airborne emissions from dairy, beef, and poultry operations. A preliminary program of presenters is attached.

The Symposium is part of ARB's ongoing process to adopt a definition for a Large Confined Animal Facility (large CAF) by July 1, 2005 as required by Senate Bill 700 (Florez, 2003). Following this Symposium, we expect to have a public workshop in March 2005 to discuss the staff's proposed definition for large CAFs. We expect to release a staff report in May 2005 for consideration at the June 23, 2005 public hearing.

Details for the Symposium are as follows:

DATE: Wednesday, January 26, 2005

TIME: 9:00 a.m. to 4:00 p.m.

LOCATION: San Joaquin Valley Air Pollution Control District
Central Office
1900 East Gettysburg Avenue
Fresno, California 93726

In addition, the workshop will video teleconferenced to the following locations:

San Joaquin Valley Air Pollution Control District
Northern Office
4230 Kiernan Avenue, Suite 130
Modesto, California 95356

San Joaquin Valley Air Pollution Control District
Southern Office
2700 M Street, Suite 275
Bakersfield, California 93301

Sir/Madam

In addition to presentations by researchers, there will be limited time available for others to provide 5-minute presentations regarding technologies or practices that may help reduce livestock emissions.

The meeting places are accessible to persons with disabilities. If you have special accommodation or language needs, please contact Ms. Heather Arias at (916) 323-2722 or harias@arb.ca.gov. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

Please also contact Mr. Mike FitzGibbon at (916) 445-6243 or mfitzgib@arb.ca.gov with any questions about the workshop or if you are interested in making a short technology presentation.

Sincerely,

Robert D. Fletcher, Chief
Planning and Technical Support Division

Attachment

cc: Mr. Mike FitzGibbon, Manager
Emission Inventory Analysis Section
Planning and Technical Support Division

Ms. Heather Arias
Transportation Strategies Section
Planning and Technical Support Division

Livestock Emissions Research Symposium

Wednesday, January 26, 2005
9:00 a.m. – 4:00 p.m.

WELCOME

9:00 a.m. *Bob Fletcher, Air Resources Board*

BEEF

9:15 a.m. *"Ammonia and Hydrogen Sulfide Emissions from Beef Cattle Feedlots"*

Dr. Jacek Koziel, Iowa State University

Research in air quality engineering and livestock odor. Measurements of gas, odor, particulate matter emissions from livestock operations. Development and evaluation of odor control technologies.

DAIRY

9:45 a.m. *"On Farm Measurements of Methane and Select Carbonyl Emission Factors for Dairy Cattle"*

Terry Cassel, University of California, Davis

Modeled emission factors for methane and select carbonyls measured in spring, summer, and fall at one dairy will be presented along with a description of total non-methane, non-ethane organic carbon measurements at dairies

10:15 a.m. *Break*

10:30 a.m. *"Reactive Organic Gases (ROG) and Amine Emissions from a Northern California, Flushed Lane Dairy: Technical Approach and Report of Emission Factors"*

Dr. CE Schmidt, Independent Environmental Consultant

Results are discussed from a field-sampling project to evaluate process-specific emissions at a Northern California Dairy. The United States Environmental Protection Agency (U.S. EPA) flux chamber method was used to collect emissions of ROG, amine, and other relevant compounds. Emissions are reported for each tested process, the full facility, and on a per cow basis.

11:00 a.m. *"Use of Laser Technology to Monitor Ammonia"*

Dr. Dave Goorahoo, Dr. Charles Krauter, B. Goodrich, and Matt Beene, California State University, Fresno

A review of the technology involved in the use of an open path tunable diode laser (OPTDL) for monitoring ammonia emissions at dairies. Results showing diurnal and seasonal fluctuations of ammonia during various dairy management practices and discussion of using the OPTDL for modeling downwind emission concentrations.

11:30 a.m. *"Monitoring and Modeling of ROG and Ammonia at Three California Dairies"*

Dr. Charles Krauter, Dr. Dave Goorahoo, B. Goodrich, and Matt Beene, California State University, Fresno

Dairy emissions data from a sampling program at dairies in Merced, Fresno, and Kings Counties that began in the fall of 2002. ROG samples were collected in canisters and analyzed Gas Chromatograph Mass Spectography (GCMS) and Gas Chromatograph Flame Ionization Detection (GCFID). The ammonia was sampled with active denuders and Tunable Diode Lasers. Samples were taken upwind and at several sites downwind of various dairy operations. Modeling of emissions was done using Industrial Source Complex Short-Term version 3 (ISC-STv3), a steady state Gaussian plume model.

12:00 p.m. *Break for Lunch*

1:00 p.m. *"Process-based Approach to Estimate Air Emissions from California Dairies"*

Dr. Frank Mitloehner, University of California, Davis

Discussion of projects designed to evaluate parameters such as animal housing and manure handling, under controlled conditions using environmental chambers, on emissions from livestock facilities. We will use these data to drive a process-based model to identify the flow of carbon, nitrogen, and sulfur through the different operational processes on a dairy (feeding, housing, manure storage, land application) to eventually predict emissions of volatile organic compounds, methane, ammonia, nitrous oxide, nitric oxide, nitrogen and hydrogen sulfide. This site-specific approach will significantly improve estimates of emissions from California dairies.

1:30 p.m. *"Treatment of Dairy Manure with Anaerobic Digestion and Aeration Technologies for Reducing Gaseous Emissions"*

Dr. Ruihong Zhang, University of California, Davis

This paper reports the findings of an on-going study at U.C. Davis in quantifying the emission reductions of several gases (ammonia, hydrogen sulfide, methane, and volatile organic compounds) by anaerobic digestion and aeration treatment processes for dairy manure. Anaerobic digestion and aeration technologies have proven to be effective in providing the necessary treatment of animal waste for the benefits of water pollution control. Anaerobic digesters could also provide dairies with the benefit of biogas-energy production as well. Such waste treatment technologies are expected to reduce the air emissions from manure management systems. However, how much emission reduction that can be achieved for dairies is not known.

2:00 p.m. *"A Process Based Approach to Measure Ammonia from Dairy Operations Using a Flux Chamber Protocol"*

Dr. Saqib Mukhtar, Texas A&M University

Report on the methods and results of using flux chambers to measure ammonia emissions at dairies.

2:30 p.m. *Break*

POULTRY

2:45 p.m. *"Emissions from Poultry Production"*

Matt D. Summers, California Department of Food and Agriculture

A collaborative effort to estimate the emissions from broiler production in California is discussed. Methodology and equipment was developed so that standardized U.S. EPA source test methods could be applied to a mechanically ventilated poultry house. Resulting emissions throughout the broiler cycle for ammonia, particulate matter, and volatile organic compounds are presented and analyzed.

TECHNOLOGY PRESENTATIONS

3:15 p.m. *"Five Minute Presentations Regarding Technologies or Practices that may Help Reduce Livestock Emissions"*

Moderated by Patrick Gaffney, Air Resources Board

CLOSING

4:00 p.m. *Bob Fletcher, Air Resources Board*

FINAL PROGRAM WILL BE AVAILABLE AT THE SYMPOSIUM